

1. A capacitor device comprising:

a first plate comprising a conductive loaded, resin-based material comprising conductive materials in a base resin host; and

5 a second plate fixably held nearby but not contacting said first plate such that said first plate and said second plate are capacitively coupled.

2.The device according to Claim 1 wherein the ratio, by weight, of said conductive materials to said resin host is between about 0.20 and about 0.40.

3.The device according to Claim 1 wherein said conductive materials comprise metal powder.

4.The device according to Claim 3 wherein said metal powder is nickel, copper, or silver.

5.The device according to Claim 3 wherein said metal powder is a non-conductive material with a metal plating.

6.The device according to Claim 5 wherein said metal plating is nickel, copper, silver, or alloys thereof.

7.The device according to Claim 3 wherein said metal powder comprises a diameter of between about 3 μm and about 12 μm .

8. The device according to Claim 1 wherein said conductive materials comprise non-metal powder.

9. The device according to Claim 8 wherein said non-metal powder is carbon, graphite, or an amine-based material.

10.The device according to Claim 1 wherein said conductive materials comprise a combination of metal powder and non-metal powder.

11.The device according to Claim 1 wherein said conductive materials comprise micron conductive fiber.

12.The device according to Claim 11 wherein said micron conductive fiber is nickel plated carbon fiber, stainless steel fiber, copper fiber, silver fiber or combinations thereof.

13.The device according to Claim 11 wherein said micron conductive fiber has a diameter of between about 3 μm and

INT-03-012

about 12 μm and a length of between about 2 mm and about 14 mm.

14.The device according to Claim 1 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

15.The device according to Claim 1 wherein said second plate comprises metal.

16.The device according to Claim 1 wherein said second plate comprises said conductive loaded resin-based material.

17.The device according to Claim 1 further comprising a dielectric material between said first and second plates.

18.The device according to Claim 17 wherein said dielectric material comprises a resin-based material.

19.The device according to Claim 17 wherein said dielectric material comprises ceramic or mica.

20.The device according to Claim 17 wherein said dielectric material comprises paper.

21.The device according to Claim 17 wherein said dielectric layer further encapsulates said first and second plates.

22.The device according to Claim 1 wherein said first plate and said second plate comprise multiple material planes that are interlaced to increase parallel surfaces therebetween.

23.The device according to Claim 1 further comprising a solderable layer overlying part of said first and second plates.

24.The device according to Claim 1 wherein one of said first and second plates further comprises a circuit trace on a molded circuit board.

25.The device according to Claim 1 wherein one of said first and second plates further comprises a part of a molded housing for an electrical device.

26. A capacitor device comprising:

a first plate comprising a conductive loaded, resin-based material comprising conductive materials in a base resin host;

5 a second plate comprising said conductive loaded, resin-based material; and

a dielectric material between said first plate and said second plate wherein said first plate and said second plate are capacitively coupled.

27. The device according to Claim 26 wherein said conductive materials comprise metal powder.

28. The device according to Claim 27 wherein said metal powder is a non-conductive material with a metal plating.

29. The device according to Claim 26 wherein said conductive materials comprise non-metal powder.

30. The device according to Claim 26 wherein said conductive materials comprise a combination of metal powder and non-metal powder.

31.The device according to Claim 26 wherein said conductive materials comprise micron conductive fiber.

32.The device according to Claim 26 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

33.The device according to Claim 26 wherein said dielectric material comprises a resin-based material.

34.The device according to Claim 26 wherein said dielectric material comprises ceramic or mica.

35.The device according to Claim 26 wherein said dielectric material comprises paper.

36.The device according to Claim 26 wherein said dielectric layer further encapsulates said first and second plates.

37.The device according to Claim 26 wherein said first plate and said second plate comprise multiple material planes that are interlaced to increase parallel surfaces therebetween.

38.The device according to Claim 26 further comprising a solderable layer overlying part of said first and second plates.

39.The device according to Claim 26 wherein one of said first and second plates further comprises a circuit trace on a molded circuit board.

40.The device according to Claim 26 wherein one of said first and second plates further comprises a part of a molded housing for an electrical device.

41.A method to form a plate of a capacitor device, said method comprising:

providing a conductive loaded, resin-based material comprising conductive materials in a resin-based host; and

5 molding said conductive loaded, resin-based material into a plate for a capacitor device.

42.The method according to Claim 41 wherein the ratio, by weight, of said conductive materials to said resin host is between about 0.20 and about 0.40.

43.The method according to Claim 41 wherein the conductive

materials comprise a conductive powder.

44.The method according to Claim 41 wherein said conductive materials comprise a micron conductive fiber.

45.The method according to Claim 41 wherein said conductive materials comprise a combination of conductive powder and conductive fiber.

46.The method according to Claim 41 wherein said molding comprises:

injecting said conductive loaded, resin-based material into a mold;

5 curing said conductive loaded, resin-based material;
and

removing said plate from said mold.

47.The method according to Claim 46 further comprising forming a dielectric layer over said plate.

48. The method according to Claim 47 wherein said step of forming a dielectric layer comprises over-molding.

INT-03-012

49. The method according to Claim 47 wherein said step of forming a dielectric layer comprises dipping, spraying, or coating.

50. The method according to Claim 41 further comprising forming a dielectric layer prior to said step of injecting said conductive loaded, resin-based material into a mold wherein said plate is over-molded onto said dielectric layer.

51. The method according to Claim 41 wherein said molding comprises:

loading said conductive loaded, resin-based material into a chamber;

5 extruding said conductive loaded, resin-based material out of said chamber through a shaping outlet; and

curing said conductive loaded, resin-based material to form said plate.

52. The method according to Claim 51 further comprising stamping or milling said molded conductive loaded, resin-based material.

INT-03-012

53. The method according to Claim 51 further comprising forming a dielectric layer over said plate.

54. The method according to Claim 53 wherein said step of forming a dielectric layer comprises extrusion.

55. The method according to Claim 53 wherein said step of forming a dielectric layer comprises dipping, spraying, or coating.